

REMARKS

Favorable reconsideration and allowance of this application are requested.

I. Discussion of Claim Amendments

By way of the amendment instructions above, independent claim 1 has been revised so as to specify that the guanamine compound is one represented by the formula (2) and specify that the unit –N-X is a residue of an amine compound, a urea compound, an amide compound, an imide compound or a hydrazine compound. The revisions to claim 1 thus incorporate certain limitations appearing in original claims 2-3. As such, claim 2 has been cancelled. Claim 3 has been amended so as to specify the amine compound as disclosed on page 9, line 1 and line 20 of the originally filed specification.

Moreover, the species and the ratio of the antioxidant have been clarified in claim 1 based on original claims 6 and 7 which have in turn been cancelled. Finally, claim 1 has been amended so as to specify that the composition further comprises a processing stabilizer and/or a heat stabilizer as based on original claims 8 and 13 which in turn have been cancelled.

Process claim 17 has been cancelled and replaced by newly presented independent claim 23 which conforms to the recitations now present in the amended version of claim 1.

Therefore, claims 1, 3-5m 9-12, 14-16 and 18-23 are pending in this application for which favorable reconsideration and allowance are solicited.

I. Response to 35 USC §103(a) Rejection

Prior claims 1-22 attracted a rejection under 35 USC §103(a) as allegedly being unpatentable over Harashina et al (USP 6,673,405) in view of Japanese Patent Nos.

2002-201334, 2000-119485 and 10-67942. As will become evident from the following discussion, the claims now pending herein for consideration are patentably distinct over all such applied publications.

(1) The Applied Reference Publications

(i) Harashina discloses a polyacetal resin composition comprising a polyacetal resin, a hindered phenol-series compound, a weather (light)-resistant stabilizer, and a spiro-compound having a triazine ring (claim 1). The spiro-compound is a compound represented by the formula (1) wherein R¹ and R² are each represented by an alkylene group, an arylene group, or an aralkylene group (claim 7).

The ratio or proportion of the spiro-compound is, relative to 100 parts by weight of the polyacetal resin, about 0.001 to 10 parts by weight (column 9, lines 14-17).

The resin composition of Harashina may be further include additive(s) such as a processing stabilizer or a heat stabilizer in order to improve the moldability or the heat resistance (column 9, lines 60-63). As the heat stabilizer, Harashina discloses an nitrogen-containing compound, for example, an amine, an amide compound, a hydrazine or a derivative thereof, a polyaminotriazine [e.g. a guanamine, or derivative thereof, such as guanamine, acetoguanamine, benzoguanamine, succinoguanamine, adipoguanamine, 1,3,6-tris(3,5-diamino-2,4,6-triazinyl)-hexane and phthaloguanamine, melamine or a derivative thereof (a melamine; a condensate of melamine, such as melam, melem, mellon, etc.)], uracil or a derivative thereof and others (column 12, lines 23-61).

Harashina discloses that the therein contemplated compositions can exhibit improved weather (light)-resistant stability, particularly, greatly improved degradation (or aging) caused by light after molding and that addition of a small amount of the above-mentioned components enables to suppress or inhibit formaldehyde emission from the

polyacetal resin and an article thereof at extremely low level, and enables to improve excellently the circumferential environment (e.g., working environment and using environment) (column 18, lines 33-44).

(ii) An automatic translation of JP2002-201334 describes the polyacetal resin (A) 100 weight section and rosin -- the polyacetal resin constituent which consists of acids (B) 0.001 - the 5 weight sections (claim 1). The translation also describes the polyacetal resin constituent ... which comes to contain a stabilizer (C) 0.02 - 5 weight sections further to the polyacetal resin (A) 100 weight section (claim 8). The stabilizer (C) is a hindered phenol (claim 9).

The polyacetal resin constituent contains the formaldehyde active substance (E) 0.01 - the 2.0 weight sections further to the polyacetal resin (A) 100 weight section (claim 11). As the formaldehyde active substance, the translation also describes (1) dicyandiamide, (2) amino permutation triazine, and as (2), for example Guanamine ... melamine ... Benzoguanamine ..., 2, 4-diamino-6-methyl-sym-triazine, 2, 4-diamino-6-butyl-sym-triazine, 2, 4-diamino-6-benzyloxy-sym-triazine, 2, 4-diamino-6-butoxy-sym-triazine, 2, 4-diamino-6-cyclohexyl-sym-triazine, 2, 4-diamino-6-chloro-sym-triazine, 2, 4-diamino-6-mercaptop-sym-triazine and others (paragraph [0023]).

According to JP2002-201334, rigidity, heat-resistant rigidity, polyacetal resin excellent in the mechanical strength, especially a copolymer are obtained (paragraph [0040]).

(iii) An automatic translation of JP2000-119485 describes (A) The polyacetal resin constituent and that the (C) above-mentioned triazine derivative and cyanuric acid of the triazine derivative expressed with the (B) ... general formula (I), (II), (III), and (IV) (claim 1). As the triazine derivatives, the translation describes Guanamine, a melamine, N-butyl melamine ... 2, 4-diamino-6-benzyloxy-sym-triazine, ... a methylene-ized melamine, ethylene dimelamine, and others (paragraph [0025]).

To the thermoplastics constituent, at least one or more types of coloring agents, such as an antioxidant, a polyamide, an alkali, a weathering (light) stabilizer, a release agent, and a pigment, may be added further (paragraph [0028]). As an antioxidant, a kind of a hindered phenolic antioxidant or two sorts or more can be used (paragraph [0029]).

The polyacetal resin constituent of JP2000-119485 can be used suitably for components, such as a circumference of the field of which thermal resistance is required, for example, the exterior parts of an automobile, and an engine, since mold-proof deposit nature and the surface appearance nature of mold goods are improved and it excels in coincidence also at heat-resistant aging nature, and since productivity is also good, it is greatly useful on industry (paragraph [0080]).

(iv) An automatic translation of JP10-67942 describes at least one type and paraformaldehyde of the triazine derivative which has at least one or more formaldehyde and the nitrogen-containing functional group which can react in 1 molecule, the additive for thermoplastics which is mixture with the formaldehyde generating object chosen from formalin aqueous solution (claim 1). The additive for thermoplastics according to claim 1 which is at least one sort chosen from the amino permutation triazine compound expressed with the compound which serves as a general formula (D) from (E) and a general formula (F), (G), and (H) (claim 2).

The thermoplastics is at least one or more of an olefin system polymer, ABS plastics, polyphenylene ether resin, polyacetal resin, polycarbonate resin, polyamide resin, polyester resin, and a styrene system polymer (claim 10).

As the triazine derivative, the methylene-ized melamine, ethylene dimelamine which are shown by the general formula (C), ... the ethylene dimelamine SHIANU rate which serves as a general formula (C) from (E) are described in the translation (paragraph [0026]).

The addition of the additive for thermoplastics which consists of a triazine derivative results in formaldehyde generation of 0.005 - 30 weight section as a triazine derivative to the thermoplastics 100 weight section (paragraph [0034]).

The thermoplastics is resin in which injection molding, such as an olefin system polymer, ABS plastics, polyphenylene ether, polyacetal resin, polycarbonate resin, polyamide resin, polyester resin, and a styrene system polymer, is possible (paragraph [0035]).

To the thermoplastics constituent, at least one sort of an antioxidant, a polyamide, an alkali, a weathering (light) stabilizer, and a release agent may be added further. As an anti-oxidant, it is n-octadecyl -3-(3',5'-di-t-butyl-4'-hydroxyphenyl)-propionate, n-octadecyl-3-(3'-methyl-5'-t-butyl-4'-hydroxyphenyl)-propionate, n-tetradecyl-3 -(3',5'-di-t-butyl-4'-hydroxyphenyl)-propionate and 1,6-hexanediol-screw-(3-(3,5-di-t-butyl-4-hydroxyphenyl)-propionate)(paragraph [0053]).

The addition of the above-mentioned additive is the 0.1 - 5.0 weight section to the polyacetal resin 100 weight section, when thermoplastics is polyacetal resin (paragraph [0074]).

Melt-kneading of the additive for thermoplastics may be accomplished during fabrication and an excellent surface appearance of a casting can be obtained (paragraph [0140]).

(2) Patentability of the Present Invention over the Cited Reference Publications

The cited reference publications all fail to disclose or suggest the specific guanamine compound employed in the practice of the present invention, in addition to the specific combination of the guanamine compound, the antioxidant, and the processing stabilizer and/or heat stabilizer in relation to the polyacetal resin.

Applicants note in this regard that, although Harashina discloses a guanamine compound having a spiro ring, this spiro ring is clearly different from the amine residue in the specific guanamine compound defined in the claims pending herein according to the present invention. Moreover, all the cited reference publications disclose a guanamine compound having a simple structure, such as guanamine. However, such a simple guanamine compound is also clearly distinct from the above specific guanamine compound as defined in the applicants' claims. Furthermore, the cited reference publications describe the simple guanamine compound as the same rank or level as other compounds, such as melamine. Thus, the ordinarily skilled person would not be motivated by the cited reference publications to employ either the specific guanamine compound of the present invention or the above specific combination of components.

Applicants also note that the present invention shows unexpected results. That is, since Harashina essentially employs a specific spiro compound, different in a structure from the specific guanamine compound having an amine residue as defined in the present invention, effects by such specific guanamine compound would never be predicted from Harashina. Since the cited reference publications as well as Harashina describe a simple guanamine compound as the same rank or level as melamine, the reference publications in essence provide a teaching which corresponds to Comparative Examples 2 and 5 of the present application using melamine which does not efficiently inhibit blooming and mold deposits.

In direct contrast, according to the present invention, since the polyacetal resin composition comprises the specific guanamine compound as defined in the claims in addition to the above-noted specific combination of components, formaldehyde emission is remarkably suppressed or inhibited. As a result, deposition of decomposition products on the mold (mold deposit) and blooming or bleeding of such products from a shaped article are inhibited. Such results are clearly supported by the Examples in the applicants' originally filed specification. That is, comparing the above

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Comparative Examples 2 and 5 with the Examples 18-23, the mold deposit in the Examples is the greatest grade "1" among the five grades relative to the worst grade "5" in the Comparative Examples. Moreover, no bleeding was observed in the Examples (i.e., the greatest rank A), but the extremely heavy bleeding was observed in the Comparative Examples (i.e., the worst rank C). These results would never be predicted from the cited reference publications.

III. Conclusion

Every effort has been made to advance prosecution of this application to allowance. Therefore, in view of the amendments and remarks above, applicant suggests that all claims are in condition for allowance and Official Notice of the same is solicited.

Should any small matters remain outstanding, the Examiner is encouraged to telephone the Applicants' undersigned attorney so that the same may be resolved without the need for an additional written action and reply.

An early and favorable reply on the merits is awaited.

Respectfully submitted,

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